

# ABSTRACT OF THE DISCLOSURE

The present invention relates to a method for forming piezoelectric/electrostrictive film element at low temperature using electrophoretic deposition, the method comprising the steps of: preparing a solution or a dispersed mixture containing constituent ceramic elements by dissolving or dispersing the raw material of constituent ceramic elements in a solvent or a dispersion medium; preparing a mixed solution by adding citric acid into the solution or the dispersed mixture in which the constituent ceramic elements are dissolved or dispersed; getting ultrafine ceramic oxide powder of particle size less than 1  $\mu\text{m}$  with uniform particle diameter size distribution by forming ceramic oxide without scattering over, by nonexplosive oxidative-reductive combustion reaction by thermally treating the mixed solution at 100-500°C; preparing a suspension by dispersing the ultrafine ceramic oxide powder in an organic dispersant; preparing ceramic sol solution by dissolving constituent ceramic elements of same or similar constituent with the ultrafine ceramic oxide powder in water or an organic solvent; dispersing by mixing the suspension in which the ultrafine ceramic oxide powder is dispersed with the ceramic sol solution; forming a piezoelectric/electrostrictive film element by submerging a substrate into the suspension which the ultrafine ceramic oxide powder and the ceramic sol solution are mixed and then by performing electrophoretic deposition; and thermally treating the piezoelectric/electrostrictive film element at 100-600°C.

Also the present invention relates to a piezoelectric/electrostrictive film element produced by the

method. Whose advantageous effects are that energy required for electrophoretic deposition process is reduced and piezoelectric/electrostrictive film element can be formed where stacking status of particles is very dense even only with low temperature treatment.

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